This is a sample protocol that can be edited by a veterinarian for treatment of cats with upper respiratory infections in a shelter. Prevention is the cornerstone to reducing shelter acquired upper respiratory infection. Feline URI is a stress-related disease and primary interventions should center around stress reduction, in particular providing high quality housing (compartmentalized units for single cats/kittens or small rooms) and minimizing the movement of cats within the shelter.

When respiratory illness does occur recovery is often quickest in a home where stress can be reduced, housing is improved and exposure to other cats can be minimized. Shelters are encouraged to seek opportunities for cats with URI to leave the shelter to a foster or adopter’s home and not wait for clinical resolution.

|  |  |  |
| --- | --- | --- |
| **Clinical signs** | **Probable Interpretation** | **Intervention/Treatment** |
| Clear discharge from eyes or nose, sneezing, intermittent squinting | Mild viral URI | Leave in place and note to clean/feed after healthy cats. In all cases, cats should be monitored at least daily (appetite, hydration, clinical signs) by staff/trained volunteers and examined by a veterinarian if clinical signs worsen. |
| Sneezing, congestion and/or squinting with mucoid (green, yellow or bloody) nasal or ocular discharge | Viral URI with secondary bacterial rhinitis and/or ocular infection | Isolate affected individual(s) in a separate room away from healthy cats. Seek foster and continue to make available for adoption.**Doxycycline**[**2**](#_bookmark1)or Minocycline**2**10 mg/kg q24h PO x 7 days, *however*, medication only needs to be given until resolution of clinical signsRe-evaluate daily for response to treatment. If no improvement by ~5 days, or worsening at any time, consider alternate antibiotic.*In a typical (low density) home environment the use of antibiotics may not be needed for cats with these clinical signs. In a shelter environment where air quality is reduced, there is an increased density of animals and the presence of pathogens is increased antibiotics are often indicated in order to achieve the shortest time to resolution of clinical signs.* |
| Sneezing, congestion and/or squinting with green, yellow or bloody nasal or ocular discharge-AND-Fever, dehydration, anorexia, oral ulcers, congestion, depressed-OR-Fails to respond to doxycycline | Viral URI with moderate to severe secondary bacterial infection | Isolate affected individual(s) in a separate room away from healthy cats. **Enrofloxacin** 5 mg/kg q24h PO or SQ x 7 days, *however*, medication only needs to be given until resolution of clinical signs.-OR-**Other fluoroquinolone** (e.g., pradofloxacin, marbofloxacin, orbifloxacin)-OR-**Azithromycin** 5–10 mg/kg q24h PO for 5 days or less until resolution of clinical signs. In some cases continuation q48h until resolution of clinical signs may be of benefit.Supportive therapy as below for anorexia, dehydration, ulceration.Re-evaluate daily for response to treatment. If fails to respond to treatment within 3-5 days, perform full veterinary exam and consider diagnostics (see below).*Parenteral antimicrobials are preferred in anorexic patients and those with pneumonia.* |

|  |  |  |
| --- | --- | --- |
| Unilateral to bilateral ocular discharge with mild to moderate conjunctivitis and/or chemosis | Bacterial (primary or secondary) or viral ocular infection(most common pathogens- feline herpesvirus, *Chlamydophila felis*, feline calicivirus, *Mycoplasma spp.*, *B. bronchiseptica* | *Frequent topical treatments may be stressful and improvement can occur in the absence of topical medication. For this reason, some clinicians prefer oral therapy only and avoid topical medication unless a corneal ulcer is present.* **Topical options:**1. Tetracycline Ophthalmic ointmentOU q. 6-8 hrs x 7 days
2. Erythromycin ophthalmic ointment OU q. 6-8 hrs x 7 days
3. Fluoroquinolone topical solution (e.g. ciprofloxacin)- if availability of above is limited.

AND/ OR**Oral therapy:** Doxycycline(or Minocycline) 10 mg/kg q24h PO x 7 days, *however*, medication only needs to be given until resolution of clinical signs. (see notes below on doxy compounding).Re-evaluate daily for response to treatment. If fails to improve with treatment within ~5 days, perform full veterinary exam, consider systemic therapy if not already done +/- diagnostic testing. |
| Unilateral to bilateral ocular discharge with mild to moderate conjunctivitis and/or chemosis -AND-corneal edema, corneal ulceration, blepharospasm | Severe primary viral ocular infection with or without secondary bacterial component | Perform full veterinary exam, identify if corneal ulceration is present. Address pain- see below.**Topical:**1. **Antibiotic** (for secondary bacterial infection)
	1. Fluoroquinolone ophthalmic solution (e.g. ciprofloxacin)- 1 drop to affected eye q. 6 hours.
2. **High-quality artificial tear** (eg, hyaluronate) preparations applied frequently may be of benefit. (FHV-1 infection reduces conjunctival goblet cells and causes qualitative tear film disorders)

**Oral:**1. **Famcyclovir** 90 mg/kg PO q. 12 hr.

Re-evaluate daily for response to treatment. |
| Fever, dehydration, anorexia, oral ulcers, congestion, depressed. Rapid or difficulty breathing, coughing, vomiting, severe diarrhea, swelling of any part of the body-OR-Failure to respond to two rounds of antibiotic treatment | Complicated URI or additional problems |  Perform full veterinary exam.Supportive care for *dehydration, pyrexia, pain, congestion, anorexia* (see below). Consider diagnostic tests (see below). Rule-out additional medical problems |

|  |
| --- |
| **Feline URI: Supportive Treatment** |
| **Condition** | **Treatment** |
| Dehydration | Mild- moderate dehydration- Subcutaneous fluids (LRS or Normosol-R) 20-40 ml/kg q. 12-24 hrs.Moderate to severe dehydration- Administer intravenous fluids until dehydration is corrected.Vitamin B Complex may be administered with fluids (1 ml per liter). Cover fluid bag with a paper bag to prevent degradation of the vitamins.Add KCL to fluids for anorexic cats (20 mEq per liter)  |
| Congestion | Clean nose with warm moist gauze or Kleenex |
|  | Humidifier in the room may be of benefit |
|  | As last resort *only if cat is severely congested and not eating*, try a decongestant (phenylephrine or oxymetazoline). One drop BID before feeding in alternating nostrils. Left nostril AM and right nostril PM for no more than 3 days. Continuous use of decongestant nose drops will decrease its effectiveness and cause a rebound effect when stopped. |
| Anorexia | Correct dehydration, treat congestion, provide analgesia, offer strong-smelling food. Consider anti-nausea therapy +/- appetite stimulants |
|  | Cats are particularly sensitive to environmental factors. Attempt the following: warm food slightly (alternatively chilling the food if aromas appear to result in nausea), then offer a novel brand/flavor of food including strongly scented wet cat food or tuna. Elevate food bowl so that the cat does not need to bend over to eat. Encourage eating by petting and soft talk, or try feeding out of the cage in a quiet environment. Offer fresh food several times per day. |
|  | Perform a complete oral examination. Oral ulcerations can cause anorexia and require analgesia. |
|  | Response trial to maropitant (Cerenia®) injectable 1 mg/kg SQ. |
|  | If steps given above fail, no other underlying cause is identified, and cat does not eat for > 2 days, consider appetite-stimulating medications: **Mirtazapine-** Mirataz® transdermal ointment, 2 mg/cat q. 24 hrs OR 15 mg tablets – 1/8 tab q 24 hrs. PO (Mirtazapine demonstrates anti-nausea properties in humans, likely since it acts at the 5HT3 receptor similarly to ondansetron)-OR-**Capromorelin (Entyce**®**)** approved in dogs, off label use reported in cats. |
|  | If appetite does not respond to appetite stimulants, and anorexia persists for more than ~5 days, consider placing an esophageal feeding tube. Force-feeding or syringe-feeding high calorie foods (e.g., a/d or MaxCal) are also options, but may cause food aversion and worsen anorexia and can be hard to meet calroic needs. |
|  | Remember - kittens need 250 kcal per kg per day |
|  | Monitor weight regularly, ideally several times a week. |

|  |  |
| --- | --- |
| Pain | Pain is associated with oral or nasal planum ulceration, corneal ulceration, and potentially severe systemic disease (e.g. joint pain associated with calicivirus, pain associated with dehydration), and must be treated accordingly. **Opioids:** 1. **Buprenorphine SR** (sustained release) 0.12 mg/kg q72 hours SQ
2. **Simbadol™** (buprenorphine injection) 0.24 mg/kg q 24 hours SQ for up to 3 days
3. **Buprenorphine** 0.01 – 0.02 mg/kg q4-6 hrs. prn IM, IV (trans-mucosal is an option only if no oral ulceration)

 **NSAIDS:** *ENSURE ADEQUATE HYDRATION PRIOR TO ADMINISTRATION OF ANY NSAID*1. **Meloxicam** 0.1 mg/kg once PO, SQ. Subsequent dose starting 24 hours after initial dose at 0.05 mg/kg q 24 hrs. PO x 3 days. Oral off-label dosage derived from the International Society of Feline Practitioners and the American Association of Feline Practitioners joint consensus guidelines published in 2010 (Journal of Feline Medicine and Surgery (2010) 12, 521–538.)
2. **Robenacoxib (Onsior**®**)** 2 mg/kg SQ q. 24hrs or 1 mg/kg PO q. 24 hrs, either can be given up to 3 days.

**Local anesthetics:**1. **Lidocaine** 4% viscous. Apply directly to affected area q 6-8 hrs. prn.
 |
| Fever | Perform veterinary exam |
| Administer crystalloid fluids (subcutaneous or intravenous) |
| Rule-out other systemic problems or lower respiratory tract involvement (thoracic radiographs if possible) |

|  |
| --- |
| **Feline URI: Diagnostic Tests** |
| FeLV/ FIV testing | Retroviral screening using in-house ELISA +/- PCR if not responding to treatment. |
| Polyp check | Full visual oro-nasopharyngeal examination under anesthesia. |
| PCR Respiratory Pathogen Panel | Deep pharyngeal samples for submission to a laboratory if clinical signs are more severe, there is limited to no response to treatment or a larger than typical number of cats affected. |
| Aerobic Culture and Sensitivity | Sedated/anesthetized nasal lavage +/- biopsy sample for submission to a laboratory (no value from culture of nasal discharge/nasal swab) |
| Radiographs | Minimum of two views of thorax to determine lower respiratory tract involvement |
| Diagnostic workup | Imaging and rhinoscopy to rule out fungal, parasitic and non-infectious cause of URTD |
| A note on *Chlamydophila felis-* If there is improvement but relapse after discontinuing antibiotic, consider testing for Chlamydophila. If Chlamydia confirmed or suspected, treat with doxycycline for 4-6 weeks. Azithromycin has been shown to be ineffective in eliminating *C. felis* in cats. |

Doxycycline use and considerations

* Liquid doxycycline formulations are recommended and should be compounded in-house.
	+ Doxycycline or minocycline tablets/capsules can cause esophagitis and subsequent esophageal strictures in cats and are best avoided. If used, must be flushed with at least 6 cc of liquid.
	+ For compounding (e.g. mixing with some liquid vehicle), keep in mind that doxycycline and minocycline are highly unstable drugs and will degrade quickly and rapidly lose its potency within 7 days (Papich, et al). The capsules can be opened and diluted just prior to administration.
	+ All compounded doxycycline should be stored in light proof containers and used within 7 days.
* Citric acid-based liquids and vitamin/mineral supplements should not be used as compounding agents, as they can negatively affect the availability of tetracyclines and the breakdown products can be toxic when mixed with citric acid.
* Reference article: Papich, M.G., etal. (2013). “Doxycycline concentration over time after storage in a compounded veterinary preparation.” JAVMA 242 (12): 1674-1678.

# Feline URI Health Check

Before initiating medication, always perform a physical exam. Check the cat all over for other problems that may complicate treatment or affect treatment decisions. For a URI treatment candidate, particularly consider:

**Overall appearance:** bright, quiet, or depressed

Very depressed Suspect more severe disease, take temperature. Veterinarian check immediately.

**Hydration:** check skin turgor between shoulder blades and feel gums to see how tacky they are

Decreased turgor (skin returns, but slowly) mild-moderate dehydration. Requires fluids to correct, will need to divide up and give over 12-24 hours. See above table for more information.

Skin stands in a fold severe dehydration. Possible secondary or systemic illness. IV fluids recommended to restore adequate hydration. Veterinarian check immediately.

# Eyes, including cornea and conjunctiva:

Assess presence of discharge, conjunctival swelling, corneal irritation or ulceration, cloudiness in front chamber of eye (between iris and cornea), color of iris.

Detectable ulcer or extremely sore eye perform full ophthalmic exam plus diagnostics. Vet check. Address pain in treatment plan.

Cloudiness in front chamber of eye or discoloration of iris possible systemic illness, perform full ophthalmic exam plus diagnostics. Vet check.

# Nose:

Discharge: assess color, severity Degree of congestion

Scabs or bleeding or ulceration

# Mouth:

Ulcers or sores on tongue must address pain in treatment plan (see above)

Gingivitis or other oral inflammation may cause pain and should be addressed

# Lungs:

Note respiratory effort and character. If increasing respiratory effort note if on inspiration or exhalation.

Signs of respiratory distress  Veterinarian exam immediately.

Listen to lungs to check for lower respiratory problems. Upper respiratory sounds caused by congestion can also be heard in the lungs, but are usually louder when the stethoscope is placed directly over the nose or throat. When in doubt, have the veterinarian double check.

Abnormal lung sounds perform radiographs to determine possible pneumonia or other serious disease. Vet exam indicated.

# Temperature:

Temperature need not be taken in every case, but *should* be taken if the cat is:

* + Depressed
	+ Not eating
	+ Dehydrated
	+ Has oral ulcers
	+ Has any clinical signs besides nasal or ocular discharge and sneezing (such as vomiting, diarrhea, coughing)